

Appl. No. 10/007,186
Amdt. Dated: February 24, 2006
Office Action Dated: November 8, 2005

• • REMARKS/ ARGUMENTS • •

By the present amendment, the changes that were courteously suggested by the Examiner on page 2 of the Office Action have been made to claims 1, 4 and 5.

In addition, claim 5 has been changed to correct an obvious, inadvertent error in which the recitation "defective germination rosette formation" has been changed to "defective rosette formation."

Also, claim 4 has been changed to be commensurate with claim 1 and recite "defective germination and defective rosette formation."

The changes to the claims are believed to be properly enterable after Final Rejection inasmuch as they were suggested by the Examiner, correct obvious inadvertent errors and do not raise any new issues in the prosecution.

Claims 1, 4 and 5 are pending in this application.

Claims 1, 4 and 5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,107,051 to Job et al. in view of U.S. Patent No. 5,294,593 to Khan.

Claims 1 and 4 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Coolbear et al., *An Evaluation of the Potential of Low Temperature Pre-Sowing Treatments of Tomato Seeds as Means of Improving Germination Performance*, Ann. appl. Biol. (1987), 110, pp. 185-194 (1987) in view of Khan.

Appl. No. 10/007,186
Amdt. Dated: February 24, 2006
Office Action Dated: November 8, 2005

For the reasons set forth below, it is submitted that all of the pending claims are allowable over the prior art of record.

Favorable reconsideration by the Examiner is earnestly solicited.

The Examiner has relied upon Job et al. as teaching:

...a method of preventing defective germination and defective rosette formation of a plant seed which tends to suffer from defective germination and defective rosette formation during growth thereof (Job Col. 1 line 41-60 and line 51 since pre-sowing hydration treatment is an old and notoriously well-known means for improvement of germination quality, it also reduces defective germination and defective rosette formation) comprising the steps of: a) leaving the plant seed to stand in a highly watery condition at a low temperature in a dark place for sufficient period of time of from several days to several months (Job Col. 4 line 6 and Col. 10 line 64) to inhibit defective germination and/or rosette formation of the plant seed, the dark place being sufficiently dark to prevent the plant seed from germinating (Job Col. 3 line 39-44); and b) drying the plant seed immediately after leaving the plant seed to stand in the highly watery condition at the low temperature in a dark place (Job Col. 3 line 44-46, at this point applicant's sentence structure indicates that the seeds were in a highly watery condition at the low temperature in a dark place, but not that the seeds were dried in a dark place), before the seed becomes active, wherein in the step a) of leaving the plant seed in a highly watery condition the plant seed is immersed in water at a temperature of from 0-15 degrees C (Job Col. 3 line 65 and Col. 4 line 6 and line 17-30 that lower temperatures allows for a more controlled hydration) and a relative humidity of 100% (Job teaches the seeds are "soaked" in a cover dish thus the humidity is 100% Col. 3 line 46-50) and wherein in the step of drying the plant seed (Job Col. 3 line 45 and Col. 3 line 55-56 teaches they are store in the dark).

The Examiner concedes that:

Job does not implicitly teach that the seeds are dried in a dark place sufficiently dark to prevent exposure of the plant seed to an amount of light that is sufficient to cause the plant seed to germinate.

Appl. No. 10/007,186
Amdt. Dated: February 24, 2006
Office Action Dated: November 8, 2005

The Examiner has accordingly relied upon Khan as teaching:

...that it is old and notoriously well-known to dry hydrated seeds in the dark to prevent germination (Khan Col. 3 line 40-49).

In combining the teachings of Job et al. and Khan, the Examiner takes the position that:

It would have been obvious to one of ordinary skill in the art to modify the teachings of Job with the teachings of Khan at the time of the invention for the advantage of preventing germination to enable the seeds to be stored for a duration of time after treatment.

Job et al. is directed to studying and qualifying a protein marker (globulin 11S or "SIP") that can be used to evaluate a pre-germination treatment of seeds and thereby monitor seeds during pre-germination treatments to control and improve the germination capacity of the seeds.

In order to qualify the use of SIP as an indicator of germination, Job et al. tested three pre-germination treatment methods, including: hydroconditioning; osmoconditioning; and prehydration.

During the testing of these various pre-germination treatment methods, samples were taken at progressive stages and SIP was extracted to correlate the presence of SIP with the stage of germination.

The Examiner has focused on Job et al.'s evaluation of hydroconditioning during which seeds were soaked in water at a low temperature for various time periods and subsequently tested for germination.

As the Examiner concedes, Job et al. does not teach drying the seeds in a dark place.

Appl. No. 10/007,186
Amdt. Dated: February 24, 2006
Office Action Dated: November 8, 2005

This is because, Job et al. is not at all interested in drying the seeds since this is not a part of the pre-germination treatment.

Job et al. is only interested in determining the amount of SIP that is present at various stages of the pre-germination treatment, i.e., hydroconditioning.

There is accordingly, no reason to dry the seeds of Job et al. as the Examiner proposes. Drying the seeds does not further the goal of Job et al. which is to determine the amount of SIP that is present at various stages of the hydroconditioning

It is also noted that Job et al. only teach testing the seeds for germination.

There is no testing or any interest in rosette formation in Job et al.

As discussed in column 3, line 56 through column 4, line 6 Job et al. teach germination curves that are developed which involve three phases, including: 1) a latent stage in which no germination takes place while the seed hydrates; 2) a phase in which germination rate increases; and 3) a "plateau" in which "the maximum germination number of the batch of seeds is considered."

As can be appreciated, 1) Job et al. provides no teaching as to rosette formation; and 2) provides no teaching as to any particular drying condition, or effect obtained thereby.

Khan is directed at a method of "inducing releasable dormancy in non-dormant plant seeds" which involves soaking the seeds in a "gibberellin synthesis inhibitor solution."

As explained in column 2, lines 22-39 the gibberellin biosynthesis pathway includes seventeen steps. By introducing a gibberellin synthesis inhibitor into the seeds (by soaking the seeds in a gibberellin synthesis inhibitor solution), Khan induces dormancy into the seeds.

Appl. No. 10/007,186
Amdt. Dated: February 24, 2006
Office Action Dated: November 8, 2005

The Examiner has relied upon Khan as teaching:

...that it is old and notoriously well-known to dry hydrated seeds in the dark to prevent germination.

This is not what Khan actually teaches. Khan teaches:

The drying step (c) is carried out under conditions which do not break (release) dormancy to restore the seeds to their weight (moisture content) prior to the soaking. This is appropriately carried out by drying in air (or forced air from a fan), e.g., at 25°C. to 35°C. for 30 minutes to 5 hours, preferably from 1 to 2 hours under safe green light or total darkness for seeds where dormancy is released by light such as lettuce seeds and in light or darkness for seeds where light is ineffective in releasing dormancy such as tomato or pepper.

Khan teaches avoiding light for purposes of avoiding the release of the induced dormancy. Note the non-dormant seeds (prior to gibberellin synthesis inhibition), were capable of germination, so that the distinction between non-dormant seeds and seeds that are released from dormancy does not necessary infer that germination actually occurs.

In fact, it is noted that Khan teaches:

One method for releasing dormancy involves soaking in water in light at 25°C. to 35°C. for a time period sufficient to release dormancy and foster germination, e.g., 1 to 10 days.

Khan teaches a difference between "releasing dormancy" and "fostering germination" and teaches that the drying is actually limited in time to prevent germination.

Note the vast difference in time periods taught by Khan, i.e. 30 minutes to 5 hours (for drying) as opposed to 1 to 10 days (for releasing dormancy and fostering germination). Surely if the

Appl. No. 10/007,186
Amtd. Dated: February 24, 2006
Office Action Dated: November 8, 2005

seeds broke or released their dormancy during the drying step, they would not germinate in the short drying time.

Job et al. is not at all interested in drying the seeds for any particular reason.

Neither Job et al. nor Khan teach that the manner of drying the seeds in combination with an aqueous hydration treatment has any (beneficial) effect on germination and rosette formation. Khan in fact introduces a variable – the gibberellin synthesis inhibitor – which is known to have a direct effect on dormancy and germination. Accordingly, the method and results of Khan et al. are not directly related to or compatible with Job et al.

The Examiner seems to take the position that the combination of Job et al. and Khan inherently result in the prevention of defective rosette formation.

However, such a position does not at all establish "obviousness" under 35 U.S.C. §103.

As held by the court of appeals in *In re Rinehart*:

The view that success would have been "inherent" cannot, in this case, substitute for a showing of reasonable expectation of success. Inherency and obviousness are entirely different concepts. (*In re Rinehart*, 189 USPQ 143 (CCPA 1976)).

Moreover, as held by the CCPA in *In re Shetty*:

Inherency is quite immaterial if, as the record establishes here, one of ordinary skill in the art would not appreciate or recognize that inherent result.

The inherency of an advantage and its obviousness are entirely different questions. That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is known. (*In re Shetty*, 195 USPQ 753 (CCPA 1977)).

Appl. No. 10/007,186
Amdt. Dated: February 24, 2006
Office Action Dated: November 8, 2005

The combination of Job et al. and Khan do not render obvious a method of preventing defective rosette formation, inasmuch as either of these references mention rosette formation.

The Examiner has relied upon Coolbear et al as teaching:

...a method of preventing defective germination and/or defective rosette formation of a plant seed which tends to suffer from defective germination and/or defective rosette formation during growth thereof (Coolbear Summary line 1 and Introduction line 1 since pre-sowing hydration treatment is an old and notoriously well-known means for improvement of germination quality, it reduces defective germination and defective rosette formation) comprising the steps of: a) leaving the plant seed to stand in a highly watery condition at a low temperature in a dark place for sufficient period of time of from several days to several months (Coolbear Methods, Imbibition studies, line 3) to inhibit defective germination or rosette formation of the plant seed, the dark place being sufficiently dark to prevent the plant seed from germinating (Coolbear Methods first two sentences); and b) drying the plant seed immediately after leaving the plant seed to stand in the highly watery condition at the low temperature in a dark place (Coolbear Methods lines 4-6), at this point applicant's sentence structure indicates that the seeds were in a highly watery condition at the low temperature in a dark place, but not that the seeds were dried in a dark place), before the seed becomes active, wherein in the step a) of leaving the plant seed in a highly watery condition the plant seed is immersed in water at a temperature of from 0-15 degrees C (Coolbear Methods second sentence) and a inherently relative humidity of 100% (Coolbear teaches the seeds are in a cover dish and are continuously kept moist thus the humidity is 100%, Methods line 2-4) and wherein in the step b) of drying the plant seed (Coolbear Methods line 5).

On page 5 of the Office Action the Examiner states:

However, Job [sic] does not implicitly teach that the seeds are dried in a dark place sufficiently dark to prevent exposure of the plant seed to an amount of light that is sufficient to cause the plant seed to germinate.

In combining Coolbear et al. and Khan the Examiner takes the position that:

It would have been obvious to one of ordinary skill in the art to modify the teachings of Job [sic] with the teachings of Khan at the time of the invention for

Appl. No. 10/007,186
Amdt. Dated: February 24, 2006
Office Action Dated: November 8, 2005

the advantage of preventing germination to enable the seeds to be stored for a duration of time after treatment.

Coolbear et al. does not include any discussion as to the effect of the low-temperature pre-sowing treatment on rosette formation other than the statement that:

No evidence was found for improved seeding growth rates per se as a result of pretreatment: in fact, initial axis growth may be temporarily reduced, probably as a consequence of depletion of reserves during the treatment period.

If anything, Coolbear et al. teaches that growth after germination may be at least inhibited, if not adversely effected.

In any event, Coolbear et al, does not teach that the low-temperature pre-sowing treatment prevents defective rosette formation.

Khan is relied upon, in combination with Coolbear et al. in the same manner as the Examiner has relied upon Khan in combination with Job et al. Accordingly, the comments set forth above with respect to Khan apply to the combination of Coolbear et al, and Khan.

As noted previously, Job et al. cites and refers to Coolbear et al. throughout the disclosure and uses a hydroconditioning method taught by Coolbear et al.

On page 6 of the Office Action the Examiner has presented an argument to the effect that "if the germination quality is improved then the rosette formation quality is improved."

This position indicates a lack of an appreciation of the differences between germination and rosette formation. Rosette formation follows germination. Successful germination does not

Appl. No. 10/007,186
Amdt. Dated: February 24, 2006
Office Action Dated: November 8, 2005

necessary mean that rosette formation will be successful. After successful germination the plants can still fail and die if they do not have successful rosette formation and proceed to vernalization.

As those skilled in the art recognize, the mechanism of plant growth is well documented and proceeds as follows: After germination, plants develop a rosette of leaves at the ground level ("rosette formation"). In the next step plant stems are produced during the vernalization step ("vernalization" comes from the Russian word yarovizatsya which means "to make or become spring").

Accordingly, successful germination does not necessary mean that rosette formation will be successful and the position that "if the germination quality is improved then the rosette formation quality is improved" is not necessarily true and certainly not supported by the teachings of the prior art or record.

On page 6 of the Office Action the Examiner states:

However, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

The Examiner seems to be presenting the type of argument that might be proper for an apparatus claim in which the preamble recites the intended use of the claimed apparatus and the prior art teaches an apparatus that meets the recited structure of the claimed apparatus.

In the present situation applicant's pending claims are method claims that recite a method of preventing defective germination and defective rosette formation (or defective rosette formation) of a

Appl. No. 10/007,186
Amdt. Dated: February 24, 2006
Office Action Dated: November 8, 2005

plant seed which tends to suffer from defective germination and defective rosette formation (or defective rosette formation) during growth, and which claims include the method steps (including a specific recitation of the seeds) which result in the effects recited in the preambles.

The prior art, individually, do not teach all the required method steps, so it cannot be said that the prior art results in applicant's recited effect or preventing defective germination and defective rosette formation (or defective rosette formation).

The Examiner's reference to "the prior art structure" and "not structurally different" is unclear, inasmuch as the prosecution should be focused on methods and method steps.

In contrast to the prior art, applicant's invention is based upon the study of rosette formation and vernalization as shown in the Examples and data presented in Tables 2 and 4 (note stem length is used to quantify vernalization).

Moreover, applicant specifically tested seeds that were known to take a relatively large number of days to germinate and which were known to easily suffer from rosette formation and concluded that the method of the present invention prevents both defective germination and defective rosette formation.

The Examiner has applied the combined the teachings of the prior art under 35 U.S.C. §103.

Obviousness under 35 U.S.C. §103 cannot be established in the present situation when the prior art is completely silent regarding rosette formation.

That is, the prior art does not at all appreciate applicant's discovery, so it cannot be said that the prior art renders applicant's invention obvious.

Appl. No. 10/007,186
Amdt. Dated: February 24, 2006
Office Action Dated: November 8, 2005

The Examiner is referred to the holding by the federal circuit in *In re Kaslow*:

It should not be necessary for this court to point out that a patentable invention may be in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. This is part of the "subject matter as a whole" which should always be considered in determining the obviousness of an invention under 35 USC 103. *In re Kaslow*, 217 USPQ 1089 (Fed. Cir. 1983)

In the present situation it can be readily concluded that the source of the problem, i.e. defective rosette formation, which applicant's invention solves is not at all recognized by the prior art relied upon by the Examiner.

Accordingly, applicant's solution cannot be found obvious over the teachings of the prior art.

It is further noted that each of the rejections of the claims relies upon a combination of prior art references.

It therefore cannot be said that the combined teachings of the references, neither of which even mention rosette formation, in any way render obvious applicant's claimed invention.

Combining any number of references that do not individually teach preventing defective rosette formation will never result in rendering preventing defective rosette formation obvious, because obvious under 35 U.S.C. §103 is founded upon what the prior art teaches or suggests to those skilled in the art. That which is not taught simply can never be "obvious."

Moreover, as noted above, "Inherency and obviousness are entirely different concepts" and "Inherency is quite immaterial if, as the record establishes here, one of ordinary skill in the art would not appreciate or recognize that inherent result."

Appl. No. 10/007,186
Amdt. Dated: February 24, 2006
Office Action Dated: November 8, 2005

Based upon the above distinctions between the prior art relied upon by the Examiner and the present invention, and the overall teachings of prior art, properly considered as a whole, it is respectfully submitted that the Examiner cannot maintain reliance upon the prior art as required under 35 U.S.C. §103 to establish a *prima facie* case of obviousness of applicant's claimed invention.

It is, therefore, submitted that any reliance upon prior art would be improper inasmuch as the prior art does not remotely anticipate, teach, suggest or render obvious the present invention.

It is submitted that the claims, as now amended, and the discussion contained herein clearly show that the claimed invention is novel and neither anticipated nor obvious over the teachings of the prior art and the outstanding rejections of the claims should hence be withdrawn.

Therefore, reconsideration and withdrawal of the outstanding rejection of the claims and an early allowance of the claims is believed to be in order.

It is believed that the above represents a complete response to the Official Action and reconsideration is requested.

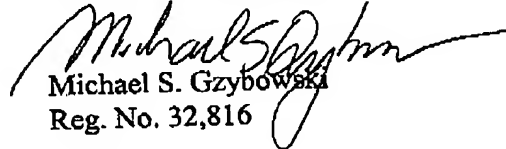
If upon consideration of the above, the Examiner should feel that there remain outstanding issues in the present application that could be resolved, the Examiner is invited to contact applicant's patent counsel at the telephone number given below to discuss such issues.

To the extent necessary, a petition for an extension of time under 37 CFR §1.136 is hereby made. Please charge the fees due in connection with the filing of this paper, including extension of

Appl. No. 10/007,186
Amdt. Dated: February 24, 2006
Office Action Dated: November 8, 2005

time fees, to Deposit Account No. 12-2136 and please credit any excess fees to such deposit account.

Respectfully submitted,


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